whole. The last-named test-pieces are then broken, and their behaviour under fracture, as well as the appearance of the latter, is used for an approximate determination of the carbon content.

If the water-quenched test bmaks at tho first light blow, the carbon content amounts to moro than CM per cent.; tho surface of the fracture shows (presuming that tho mefal is not brought into the water under a bright red boat) tho moro lustrous grain the higher the carbon content is.

If the test sustains a bonding before fracture, whilst it only breaks at the second blow, or resists still moro blows, and tbo surface of the fracture shows a matt and coarser grain than the previous test, as well as a border of lino sinews at tho edges, the metal contains CM to O'J* por cent. (!.

If the test only breaks after a serins of blows, and after bending, which can amount to 1HO", and tho surface of tho fracture consists of dull, coarse grain, awl a very perceptible border of sinews, the carbon content amounts to (hi to 0"2 per cent.

If the test bars admit of being boat together through 180° without exhibiting cracks, tho carbon content amounts to less than 0*2 per cent. The carbon content of Iot4s of tbo last-named category can bo determined still more? accurately if the bars are nicked by a chisel and fractured by means of a hammer at the nicked point. With a carbon content of about 0*15 per cent, this easily takes place, and only grain is exhibited, and in proportion as tho carbon content goes down, the fracture is preceded by more and more bending, and simultaneously the border of sinews which Hnrrounds the fractured surface is -still more marked until finally below 0*1 per cent. C all grain has vanished and only siumvs appear.

The pieces cut from the forged tents mentioned and slowly cooled down are able at times to perform good Herviee as supplements to the hardened lusts. They art*, bent in tho cold state in such wise that they take, a U form, whereon the distance between the inner surfaces of both anus IK reduced by blows "until fracture occurs, which must take place in the apex of the bend. If fracture onsiiOH when the distance between the two surfaces of tho arum is equal it) about three